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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,653	06/20/2006	Takeo Okabe	OGOSH56USA	8832

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EXAMINER	
BAND, MICHAEL A	

ART UNIT	PAPER NUMBER
1723	

NOTIFICATION DATE	DELIVERY MODE
02/15/2012	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@howsonandhowson.com

Office Action Summary	Application No.	Applicant(s)	
	10/596,653	OKABE ET AL.	
	Examiner	Art Unit	
	MICHAEL BAND	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2012*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1,2,7-11,13 and 15-26* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,2,7-11,13 and 15-26* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 7-11, 13, 17-23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (US Patent No. 6,619,537) in view of Fukuda (JP No. 03079734) and Honjo et al (JP No. 10168532).

With respect to claims 1-2 and 17-19, Zhang et al discloses a sputter target assembly including a high purity copper alloy sputter target [12] having a back face [14] diffusion bonded directly to a backing plate [16] of a Cu alloy (fig. 1; abstract; col. 1, lines 56-67; col. 2, lines 1-21). However Zhang et al is limited in that a specific composition of the Cu alloy backing plate.

Fukada discloses a copper alloy for a backing plate in a sputtering apparatus, where the copper alloy comprises 0.05 to 0.8% Cr, 0.01 to 2.5% Sn, 0.001 to 0.5% Mg, 0.01 to 0.3% Si, and the balance Cu, with Fukada citing the advantages of the specified weight percentages as reducing deformation due to thermal strains, permit repeated use, and improving the heat conductivity and brazability (abstract).

It would have been obvious to one of ordinary skill in the art to use the specified copper alloy weight percentages taught by Fukada for the Cu alloy backing plate of

Zhang et al to gain the advantages of reducing deformation due to thermal strains, permit repeated use, and improving the heat conductivity.

However Fukuda is limited in that adding Ni is not suggested.

Honjo et al teaches a Cu alloy for a backing plate comprising one or more kinds among Sn, Ni, Si, Cr, and Mg by 0.001 to 1.0%, and the balance Cu, with the advantage of using these materials being excellent machinability, thermal conductivity, thermal resistance, and brazability (abstract).

Since the prior art of Honjo et al recognizes the equivalency of Sn and Ni in overlapping composition ranges in the field of copper alloy backing plates having excellent thermal conductivity and brazability, it would have been obvious to one of ordinary skill in the art to replace Sn of Fukuda with Ni of Honjo et al as it is merely the selection of functionally equivalent materials recognized in the art for improving thermal conductivity and brazability and one of ordinary skill would have a reasonable expectation of success in doing so.

With respect to claims 7, 10, and 20, modified Zhang et al further discloses a copper alloy having similar weight percentages of Cr, Ni, and Si as discussed above. Therefore it is expected that the copper alloy backing plate possesses the properties of an electrical conductivity of 35 to 60% and 0.2% proof stress of 400 to 850 MPa. See MPEP 2112.01, Section I. If not, it must be due to a structural limitation not currently present.

With respect to claims 8-9, 11, and 13, modified Zhang et al further discloses using a hot isostatic pressing (HIPing) method to use diffusion bonding of the target and

backing plate (col. 5, lines 4-9), where the diffusion bonding is at a temperature of about 350°C (col. 5, lines 51-59).

With respect to claims 21-23 and 26, modified Fukuda further teaches that the Cu alloy comprises 0.05-8% Cr and one or more kinds among 0.01-2.5% Sn (i.e. Ni), 0.01-1% Zn, 0.01-0.3% Si, 0.01-0.3% Zr, 0.001 to 0.5% Mg, 0.01 to 1.0% Te, and 0.1 to 4.0% Pb, with the remaining percentage being Cu. Therefore a minimum and maximum percentage of Cu can be calculated, with the assumption that all of these materials are present in the Cu alloy, with said maximum being 99.799% Cu and said minimum being 89.6% Cu, with it being held that where the claimed ranges 'overlap or lie inside ranges disclosed by the prior art' a *prima facie* case of obviousness exists. See MPEP 2144.05, Section I. Therefore it is obvious that modified Fukuda teaches the Cu alloy comprises 96.2% Cu, 3% Ni, 0.65% Si, and either 0.15% Cr or Mg.

3. Claims 15-16 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (US Patent No. 6,619,537) in view of Ishikura (JP No. 01180976).

With respect to claims 15-16 and 24, Zhang et al discloses a sputter target assembly including a high purity copper alloy sputter target [12] having a back face [14] diffusion bonded directly to a backing plate [16] of a copper alloy (fig. 1; abstract; col. 1, lines 56-67; col. 2, lines 1-21). However Zhang et al is limited in that including Be into the copper alloy is not suggested.

Ishikura teaches a backing plate for sputtering, where the backing plate is copper having a purity of at least 99.7% with Be added from 100~3000 wt. ppm (abstract). Since Ishikura teaches a copper alloy backing plate having the claimed weight

percentages of Be, it is expected that the copper alloy backing plate possesses the properties of an electrical conductivity of 35 to 60% and 0.2% proof stress of 400 to 850 MPa. See MPEP 2112.01, Section I. If not, it must be due to a structural limitation not currently present. Ishikura cites the advantage of adding the Be to the backing plate as producing a significant cooling effect from satisfactory heat conductivity and the diffusion of Cu being inhibited (abstract).

It would have been obvious to one of ordinary skill in the art to incorporate adding Be to the copper backing plate taught by Ishikura for the copper alloy backing plate of Zhang et al to gain the advantage of producing a significant cooling effect from satisfactory heat conductivity and the diffusion of Cu being inhibited.

4. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (US Patent No. 6,619,537) and Ishikura (JP No. 01180976) as applied to claim 15, and further in view of Honjo et al (JP No. 01180975).

With respect to claim 25, the references are cited as discussed for claim 15. Ishikura further teaches that the Cu alloy backing plate comprises one or more among Zn, In, Mn, Sb, Be, Ca, Cr, Te, Y, Nb, Mo, Ta and Sn (abstract). However Ishikura is limited in that it is not suggested to incorporate Ni and Co.

Honjo et al teaches a Cu alloy for a backing plate comprising 0.01 to 1.0% Co and one or more kinds among Zn, Sn, Ni, Fe, Pb, Si, Al, Zr, Cr, Ti, In, Mg and Ag by 0.001 to 1.0%, and the balance Cu, with the advantage of using these materials being excellent machinability, thermal conductivity, thermal resistance, and brazability (abstract).

It would have been obvious to one of ordinary skill in the art to incorporate 1.0% Co and 1.0% Ni taught by Honjo et al into the Cu-Be alloy backing plate of Ishikura to gain the advantages of excellent machinability, thermal conductivity, thermal resistance, and brazability.

The combination of references Ishikura and Honjo et al teach a Cu alloy backing plate comprising 0.3% Be, 1.0% Co, and 1.0% Ni, with the balance of Cu being 97.7%, with it being held that a *prima facie* case of obviousness exists where the claimed ranges (i.e. 2.1% Ni and Co) and prior art ranges (i.e. 1.0% Ni and 1.0% Co) do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. See MPEP 2144.05, Section I.

Response to Arguments

103 Rejections

5. Applicant's arguments filed 1/25/2012 have been fully considered but they are not persuasive.

6. On p. 2-7, the Applicant argues that Zhang et al teaches away from directly bonding the sputter target to the backing plate.

The Examiner respectfully disagrees. It has been held that 'patents are relevant as prior art for all they contain, with the use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain'. See MPEP 2123, Section I; MPEP 2145, Section X, Part D, #1. Therefore Zhang et al

does teach that it is known in the prior art to use diffusion bonding to directly bond the sputter target of Cu alloy to a backing late of a Cu alloy (abstract; col. 1, lines 56-67; col. 2, lines 1-21) despite the invention of Zhang et al being directed to using an interlayer of Ni or Ti between the sputter target and backing plate as argued by the Applicant. Regarding how Zhang et al teaches that it is necessary to use the interlayer to eliminate the intermetallic phase, Zhang et al also teaches that the bond between the Cu target and backing plates **may** produce the intermetallic phase which results in the interlayer being necessary, thus leading one of ordinary skill to conclude that the undesirable intermetallic phase is due to the composition of the Cu target and backing plate. Therefore it is the Examiner's position that by using the Cu target with the backing plate composition taught by the combination of references Zhang et al, Fukada, and Honjo et al, this undesirable intermetallic phase would not be produced when directly bonding the Cu target to the backing plate, and thus one of ordinary skill would conclude that the interlayer would **not be necessary**, and thus directly bonding a Cu target to a Cu alloy backing plate is known in the prior art to one of ordinary skill in view of the teaching of Zhang et al.

7. On p. 7, the Applicant argues that Honjo et al does not disclose Ni in a range of 2-4wt%.

The Examiner agrees with the Applicant, hence why Honjo et al is combined with Fukuda in the rejection of claims 1 and 17 above, since Fukuda teaches Sn from 0.01-2.5%, and Honjo et al teaches Sn and Ni are functional equivalents and interchangeable

and known in the art for improving thermal conductivity and brazability, one of ordinary skill would find it obvious to use Ni 0.01-2.5% instead of Sn.

8. On p. 8, the Applicant argues that it would not be obvious to combine the references Fukuda and Honjo et al since they require different essential elements.

The Examiner respectfully disagrees. The references of Fukua and Honjo et al are both related to a Cu alloy backing plate, where Fukuda teaches the Cu alloy comprising Cr in addition to Sn, Mg, and Si (abstract), and Honjo et al teaching the Cu alloy comprises Co and P in addition to Sn, Ni, Si, Cr, and Mg (abstract). Therefore Honjo et al and Fukuda teach the Cu alloy for the backing plate comprising overlapping materials, with Honjo et al citing the advantage of including Co and P as improving thermal conductivity and brazability in addition to Sn and Ni being functional equivalent materials for Cu backing plates having excellent thermal conductivity and brazability (abstracts).

9. On p. 9-10, the Applicant argues that there is no common sense motivation for modifying Ishikura with Honjo et al since it is completely unknown as to whether superior mechanical workability, thermal conductivity, heat resistance, and brazing properties would be provided.

The Examiner respectfully disagrees. In response to Applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the Examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves

or in the knowledge generally available to one of ordinary skill in the art. See MPEP 2145, Section X, Part C. In this case, the Honjo et al suggests to one of ordinary skill in the art the idea that adding Co and P results would result in improvements of strength and thermal resistance (abstract). Furthermore Honjo et al also teaches that Sn and Ni are functional equivalent materials for Cu backing plates since both Sn and Ni result in excellent thermal conductivity and brazability (abstract).

10. All other arguments are directed towards the subject matter above and have been addressed accordingly.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1723

/Keith D. Hendricks/

Supervisory Patent Examiner, Art Unit 1724